THE SCOPE

OCTOBER

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THE SCOPE

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THE SCOPE

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The Student Council

This Fall the Student Council of Massachusetts School of Optometry enters upon its second year of existence. This body was organized primarily for the purpose of governing student activities, and naturally is made up of men and women students who in the past have manifested a constructive and progressive influence over their fellow-students.

Last year, the council handled several important matters most efficiently, *e. g.*, directing inter-class relationships, and assisting the Dean in legislative and executive functions. This year the body expects to widen its scope of activities. The following have been elected to the Council for the school year:

Chairman

JOHN C. RUSSEL

LEO GIBBONS GEO. D. LEAVITT

ALFRED ROY E. LYNCH

Editorial

Having turned a few pages in your new books, I know you are real eager to arrive at FINIS. Of course you know that anyone may come to the end of a book and absorb very little of its contents.

The majority of simple folk feel if they appear in public, laden down with books, it's a sure sign to onlookers they are intellectuals. If you have entertained this thought it would do well to lose it now because the only one you are fooling is yourself. Many a brilliant scholar carries only his well kept note book, while his dull classmate represents a walking library.

If you give your individual attention to the day's work, keep a complete set of notes, use for reference books those recommended by your instructors, I am sure you will be following a routine that will help you more than you may realize.

The members of the staff are here to help and encourage you, not to hinder your progress. Feel free to call on them at a time that is convenient for both. Do not antagonize an individual because you are unable to grasp his work immediately. Learn to be patient and pleasant in your associations; you will find it to be the proper way out of little misunderstandings.

Above everything else, do not start off with the wrong attitude about things in general. Prime yourself into having a good outlook. Do not let yourself be discouraged easily — no concrete foundation was ever firmly built in a day. To accomplish real things, time and work must be put into force. Work cannot be accomplished unless an individual trains himself to concentrate on the task before him. One-track minds lead to the town of Nowhere.

Another little reminder for those of you who are embarking on a new career: Say little to those whom you hear talking ill of others, for whatever they may say to you of the other fellow you may rest assured they don't leave your name unmentioned in his company.

The novice must learn by experience, but if he enters an institution of higher learning bearing the thought in mind that he is no longer in secondary school, and that he must prepare for the day when he will take his place among the real men in the profession of his choice, he has helped to clear his own pathway.

Optometry Club Notes

The Optometry Club, under the able leadership of its President, George Leavitt, opened its year Wednesday evening, October 7th with a lecture by Dr. William Bencker. Dr. Bencker spoke very enlightingly upon problems facing the youth of today. A large number of the student body was in attendance.

The lecture was preceded by a short meeting in which future club endeavors were discussed. It was decided that in November the Optometry Club should present a debate. Gaidis, Swartz, and Weathers were appointed a committee to find a suitable subject and to choose the opposing teams.

It was suggsted that the Optometry Club members investigate recent Optometric literature and advise the student body as to its worth.

The Club extends a cordial invitation to the student body to attend all of its functions for the ensuing year. It shall strive to obtain lecturers who have a message for all; Seniors, Juniors and Freshmen.

The Freshman Smoker

On Wednesday, September 30, 1936, at Ritz Plaza, in Boston, the upper classmen extended their greetings to the Class of 1939, by far the largest in the history of Massachusetts School of Optometry, in the form of a smoker brilliantly conducted by Dr. John C. Russel, chairman of the committee in charge of the affair.

To those few unfortunate individuals of the student body and faculty that were unable to attend, this night is lost, irrevocably. For picture, if you can, a remarkably heterogeneous horde of a hundred and some odd vividly verdant Freshmen, respiring heavily midst a lethal corn-cob smoke screen, but giving ear with spontaneous resignation and in wide-eyed wonder to an unusually glittering galaxy of speakers.

Dean Addresses Smoker

Dr. Russel, after a few words of cordial welcome to the entering class, delivered a brief, simple, but touching eulogy on the late dean-emeritus Dr. August A. Klein, and upon his suggestion, the entire assemblage rose and paid a silent, solemn tribute to that eminent pioneer and founder of our school. Then the speaker proceeded to set forth his ideas on the importance of the "professional attitude" to Optometry, forcefully exhorting his listeners to begin its cultivation at *home* as well as in school.

Our dean, Dr. Theodore Klein, was introduced first. He expressed his pride and joy over the unprecedented attendance, and ventured to say — but this time with no apologies for annual repetition, and with no reservations — that this group confronting him certainly was the "best ever". Continuing, he laid further stress upon what eventually turned out to be the dominant theme of the evening — the professional attitude — suggesting, among other things, that an excellent way to begin would be to embrace the pipe and renounce all other "trashy" forms of tobacco indulgence.

A reverberating round of applause next greeted Dr. Paul Cline, despite the fact that he was vehemently denounced in his introduction by Chairman Russel as a profligate propagator of "two of the most abominable subjects". It was a libelous defamation of character, but he "took it on the chin" with a gracious *nolle prosequi*, and offered as his sole defence his unshakable conviction that his "abominable subjects" constituted the basic structure of Optometry.

"Both dynamic and yet so utterly different from each other"—this was Dr. Russel's terse comparison between Dr. Cline and Dr. Green, who was next on the platform. Dr. Green carried out, in his own inimitable style, his annual assignment — that of enlightening the Freshmen with regard to the school fraternity and basket-ball team. Then he also contributed a pertinent suggestion for the development and maintenance of the true professional manner — the use of the Dr. title in addressing Seniors or, when in the clinic, *any* student.

"Such dialogue in the clinic", he vehemently pointed out, "is *decidedly* out of

place: 'Hey, Foggie! Where ya bin? That's *twice* ya bin out fer a sniper! While y're here, gimmee one o' those lenses in th' middle row. *You* know, one wi' the edges all steamed up'. You *should* say, rather, 'Oh, *there* you are, Dr. ---------. Would you hand me a —.25 cylinder? Thank you'."

Next were introduced Mr. McDonald, most recent addition to the shop crew, and then Drs. Pitocchelli and Emmons of the clinical staff, each, in his turn, offering his unselfish guidance and counsel to students in the shop and clinic. Dr. Bencker was last on the roster, and whether by design or fortuity, it *did* turn out to be the strategic arrangement. He served admirably in relieving the tension and breaking ground for the entertainment committee, with an amusing little tale based on the peculiarly-shaped physiognomy of Mr. Farley.

First on the program of entertainment was Dr. H. Shepard, who kindly and courageously offered two vocal selections. Then Mr. Anthony Salerno, erstwhile Nijinsky of the Freshman Class, brought down the house with a ballet that reminded one faintly, very faintly, of Stravinsky's "The Fire-bird". And finally, there was the omnipresent and omniscient Dr. Russel, who, not content with having produced and directed the show, completely and utterly "stole" it — with three violin selections that left his audience veritably transfixed with awe and admiration.

Following this program, a happy, informal hour ensued, during which the Freshmen were made part and parcel of Massachusetts School of Optometry. Inhibitions were temporarily abandoned and unbridled conviviality was rampant. Sandwiches and pop were plentiful — so much so, in fact, that those with a little more foresight than others were able to put away two or three days' lunch money for a Duke-Elder!

M. H. B.

Massachusetts Optometric Clinic

Once again the Massachusetts School of Optometry has opened its Clinic, which occupies the entire first floor of the present four-story school building. Containing twenty complete refracting booths, as well as space for orthoptic training and field study, it is one of the best equipped of its type in the country. Patients who have previously made appointments are treated here daily from 9 A. M. to 5 P. M. Many charitable cases referred by social service workers are treated, in addition to the patients who pay a nominal fee.

In addition to the excellent equipment available for refraction, the Clinic prides itself in its Orthoptic division. Constantly in use are several Rotoscopes, Stereo-Orthoptors, and Telebinoculars, as well as many smaller supplementary devices. Included among the new equipment added this fall is an Opthalmo-O-Graph, and a Metron-O-Scope, both of which are being utilized for research studies in visual efficiency.

An enlarged clinical staff, working under the guidance of Dr. Theodore F. Klein, and with the able assistance of the Faculty, is capably carrying out its duties, supervising all the visual examinations done by the members of the Senior class, as well as doing research work in optometric problems. Because of the many opportunities available to the undergraduates here in the Clinic for the application of practical optometry and its associated ethical problems, more and more graduates are going forth each year to practice Optometry with a deeper appreciation of the fundamental problems confronting the present day professional man.

Freshman Class

It is rather presumptuous of one to assume knowledge of the reaction of an entire Freshman body, but it probably will be agreed that this new class has concurrence of thought along a few specified lines. We are impressed with the fact that we are in a Professional school, dissociated from anything we had ever encountered before, as regards to the subject matter and method. As the days go by, we can see a positive inter-relation between our courses, and how each instructor aids us in tying in his particular subject with the study of Optometry as a whole. This is the more formal aspect of the school in which we have elected to pursue our course.

But there is more to the Massachusetts School of Optometry than that. The smoker, given, in the early weeks of the term brought out, to a great degree, what type of institution Masachusetts School of Optometry is. The atmosphere was pervaded by genuine friendliness, the teaching staff was brought into closer contact with the new and very "green" freshman class, and we felt really part of the larger group, along with the Juniors and Seniors. Here we saw manifestation of that spirit of co-operation which were to be continued, and still are being continued, in our daily activities at school.

Then, too, we are impressed with the manner in which the Seniors conduct their examinations, and entertain a vague hope that we might exhibit the same quiet assurance, within three short years.

But the most significant thought which comes to us in the fact that we are learning a grand, clean, and responsible profession. It promises to be a blending of theoretic principles with good, common sense. We can already see that the better we master our problems, the better the public ultimately will be served. There is already a feeling that, just by virtue of the fact that Optometry *is* young, we are the ones on whom the responsibility for the greater prestige of the profession rests. We know now that we will be well schooled, and it remains for us to maintain the high plane which our predecessors have set for us. The Freshmen certainly hope to maintain the high ideals of the profession and the school, and we're certain that they'll be saying, "1939, *there* was a class!"

FRESHMAN

Sporting News

On the 6th of October, Manager Levin issued a call for basketball candidates and was answered by a group of fourteen capable ball handlers, all of them having had previous experience in prep schools.

Only five of last year's group turned out. They are Czelusniak, Wise, Cerruti, Levandoski, and Friedman.

The following Freshmen reported: Stonehouse, Goldstein, Rosenthal, Hodgkin, Hughes, Wagner, Salerno, Fine and Braver.

As it is planned to carry a squad of ten this year, eliminations will probably be made by November, when the team will have been whipped into shape. Certainly Manager "Barney" Levin deserves a lot of credit for energy expended in building a winning outfit. This year he has arranged a tough schedule and he hopes that the student body will back the team strongly, in attendance.

If early season predictions are reliable, M. S. O. should have a successful season.

Due to the fact that a number of students have manifested an interest in bowling, it has been suggested a Club be formed.

Eye, Eye, Suh!

MAURY OSSEN

It's the iris that gives color
And it regulates the light,
With the pupil in the center
And the muscles roll it right
From the glistening cornea
To the retina behind
Where the picture of the object
Is transmitted to the mind.

DR. P. H. LINNEHAN

(reprinted from "Optometric Weekly")

Eye-O Everybody!

This is interesting: The publication of the Southern College of Optometry is named "The SCOpe". The three first letters represent the name of the college. Rather clever title, but it sort of steps on our toes ...That's why prisms were born: Grimaldi (1619-63), an Italian churchman, was the first to experiment with prisms....In China a popular cure for "red-eye" is to cover the eyelid with a piece of pork....Santonin, a treatment for roundworms, produces an odd reaction upon the visual apparatus. For about two or three hours after each dose everything appears either yellow or green to the patient (we know a few things that make us see red)....This is no fish story: The Anableps fish has divided eyes — one set for watching enemies undersea and the other for picking up food on the surface....Isn't this cute? Prof. Rathbun of Stanford once said, "A lecture is a process by which the notes of the Prof. becomes the notes of the student, without passing through the minds of either".... There are about 70 practitioners in South Africa....Heh! Heh! In June, 1936 the blind citizens of San Diego protested in Braille to the International Exposition against nudism....Yea, we've seen some of the originals, too: The first trial case was made by Natchet and Fils, of France, in 1865....Here's a statement by Holmes: The mind of the bigot is like the pupil of the eye — the more light you pour upon it the more it contracts....Much to Literature's dismay but a joy supreme to "Heye" school students: Samuels Pepy's diary began January 1st, 1660 and ceased May 31st, 1669 because of failing vision (If our clinic was in existence then, the diary might have surpassed "Anthony Adverse" — in size)... The first ophthalmometer was introduced in the United States during 1889 from a model adopted by Javal and Schiotz....Javal showed the first practical one in Paris in 1881...Fish are virtually color-blind (no, we don't know how they found out)....The first man to grind cylinders by machine in the United States was Anton Wagner, a German who came to this country in 1897 ....The difficult thing about a column is how to begin and end it — well we started it all right and here's how we end it.... Eye'll be seeing you all.

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Alumni News

The undergraduates of the Massachusetts School of Optometry are proud to have as their clinical guardians in the Massachusetts Optometric Clinic the following graduates: Drs. Anapolle, Emmons, Fishelson, Litchenstein, Pitocchelli and Singer.

At last Dr. Joseph Montminy '32, the man about town, has become a benedict. Happiness to you both.

We wonder what the results could possibly be, trying to draw plans for a new home after neutralizing a sphero-cylindrical compound combined with a prism. Eh what, Dr. Brucker?

Dr. Graham, after spending the summer throwing lenses around for brother optometrists, vacationed in the hospital, having his fauces emeried.

Very glad to hear from Dr. James K. Hirokawa '29, of Honolulu, Hawaii who is now the proud father of an eight pound boy. Mother and son are doing nicely, thank you.

New appointments to the faculty have been Mr. Grant MacDonald and Mr. Lewis Huntington.

We are happy to greet an additional guardian to the outer portals of the "sanctum sanctorum", Miss Dorothy Lowell of Amesbury, Mass.

We regret to hear of Dr. Edward Feinstein's recent illness and wish him a speedy recovery.

It is rumored that the Dr. Berlowitz-Fineberg romance is approaching the double-harness stage. Maine must be a nice place after all.

The sea-shore possesses a rather magnetic effect on some people. How is the water Dr. Bencker?

To the following graduates of the Class of 1936 we extend our heartiest congratulations on their success in passing the Massachusetts Board: Drs. Anapolle, Berlowitz, Packard, Singer and Welton.

Dr. Gerard L. Lemay '36, who successfully passed the New Hampshire Board is now located in Manchester, N. H. with his father. Good luck, Jerry.

Congratulations to Dr. Frank Comstock, now located in Nova Scotia.

Dr. Edward F. Morally '36, who passed the Rhode Island Board is now in practice with Dr. Thomas Costa '26.

Visitors to our enlarged quarters have been: Drs. Samuel Alperen, David Cohen, Leonard Helman and Donald Exford.

We want to wish Dr. Philip Quinn '29, happiness on his recent marriage. We were correct in predicting, one year ago, that Fall River kept Doc. interested.

SPECIAL NOTICE

The Massachusetts School of Optometry Alumni Association will have as guest speaker on Wednesday evening, October 28, 1936, at 8:00 o'clock, Mr. Leon A. Morrell who will present the — "Theoretical and Practical Application of Contact Lenses".

THUMBNAIL SKETCHES OF OUR STAFF

(with apologies to W. W.)

Dr. Foster Namias—A "G" man in Boston.
Dr. Ralph Green—Hitler's Iron Man.
Dr. Paul Cline—Louis Pasteur at home.
Dr. Svendsen—Lady Bountiful.
Dr. Pitocchelli—Station WMSO broadcasting.
Dr. Bencker—Sixty minutes make an hour.
Dr. Sloane—Society Doctor.
Dr. Graham—Atlas carrying the world.
Dr. McCabe—Chocolates versus redheads.
Dr. Emmons—The Iron Man's Stand-in.
Dr. Anapolle—Sophistication Personified.
Mr. Huntington—Horatio Alger.

Fraternalism

Fraternalism, dominant among the multitude of characteristics associated with success, may be grossly defined as the ability of man to promote a humane and harmonious existence with the multiple types of living structures that fall under the category of human beings. Founded on the belief of its universal necessity, fraternalism ranks high on the schedule of a scholar in all advanced institutions of learning in that it constitutes a vital portion of a student's education. The contacts of unselfish, loyal men stimulates into activity the worthy and honorable qualities of a youth and by sheer contrast inferiorates any vile, base ideas that may creep into the flexible character of a young man. It is easy to conceive how favorably any true friendship, based on mutual respect and confidence will tend to imbed itself in an individual and then present itself not only in that one contact alone but in every phase of activity indulged in by that individual. Thus, you see, to evaluate the influence and actual powers of fraternalism is to frolic with the infinitismal quantities, yet how absurdly simple is the realization that it moulds the foundation of a sincere, contented, loving character.

Although, as previously mentioned, fraternalism is important in any educational program it is not a part of any regular scholastic curriculum for it is not a subject that requires aptitude and study, but more of good fellowship, decency, and loyalty. This important function is therefore left to the extra-curricular activities which hold a harvest full of opportunities for the fellow who is a scholar not only in the classroom but in everything in which he participates. At the Massachusetts School of Optometry we are fortunate to possess a fraternal organization of a calibre in accord with the finest of organizations and whose purpose of existence is heartily commendable. The Pi Omicron Sigma fraternity was primarily established in the whole-hearted interest of progressive Optometry students and progressive Optometry. Gigantic, indeed is its purpose to consolidate the worthy Optometry students and aid them in acquiring a background most appropriate for future use and binding these men in a friendship that remains after their student days, this being the inherent faculty that creates progress in the interest of Optometry. The establishment of such amicable relations is especially beneficial to the recent graduates faced by such obstacles as making new friends and starting a professional career.

In speaking of Pi Omicron Sigma, there is a yearly initiation of new members into the organization, this usually takes place a few months after the opening of the school year. Much deliberation and discussion precedes the choice of new members, they being chosen not because of exceptional brilliance in individual achievement, but because they possess some quality that will be an asset to their fellow members and Optometry in general. Prospective members are placed under surveillance for a few weeks and are then reported on as to the advisability of accepting them in the fraternity. If accepted, they are pledged as temporary members and subjected to a rigid initiation period after which, providing they are successful, they are successful, they are put to the final "initiation night" test consummating their pre-fraternal era. It is during these hectic trial weeks that real characteristics of men are borne out, thus determining their fitness for acceptance as members.

During the year many activities are sponsored by the fraternity including social affairs, both formal and informal and educational lectures, presented by prominent speakers. As a climax to the year's progress and as a tribute to Senior members a banquet is held at the conclusion of the school year, this being a very pompous occasion.

In presenting this personal version of

fraternalism and an inkling of our fraternity it has been a pleasure to write freely portraying a true picture with the consolation that behind me stand fellows in whom I can have implicit faith. It is such faith, respect, confidence and fraternal love that is the basis of this organization. Those who are fortunate enough to possess it, are fortunate indeed and need have little fear for the so-called insurmountable obstacles of life.

J. A. G.

Ethical Optometry

by LEO GIBBONS

In all fields of endeavor it is upon the shoulders of the "new blood", so to speak, that the hopes and ambitions of the older members are placed. These youthful members are expected to pick up where the oldsters have left off either to solve the problems which confront them or to keep working and fighting onward giving the best that is in them to further the aims of themselves and those who have gone before.

Optometry, comparatively speaking, is a young profession. In this field there are an infinite number of problems to be solved, battles to be waged, ambitions to be furthered and hopes to be realized.

It is patent then, that the responsibility in matters pertaining to ways and means of reaching these varied goals is placed in the hands of the young Optometrist.

The question arises as to whether or not these youthful ones are capable of carrying on in a manner which will be a credit to those who have preceded them and a source of constant inspiration to those of the future. This question is unanswerable. It remains for the individual alone to prove to the satisfaction of all concerned that he is doing all within his power to make Optometry a better profession.

The great things in this world are not done in the Classroom. It is here that the seed of learning is planted, but it is necessary that there be fertile soil in order that the seed may sprout and develop. Fertile soil in this case means a desire on the part of the student to accept the seed and to tend it carefully so that eventually a flourishing tree shall be the result. The time spent in the Classroom, while necessary and invaluable. is but an infinitesimal part of the time which must be spent in practice, research and experimentation in order to forge ahead in our life work.

We, as students of Optometry, instinctively know that something is now ours which ought not to die; the instinct of a comparatively unknown realm burns in us. We, therefore, who are set on this course must not regard it as a light affair. Rather, we should harness infinite energy to our task realizing that ours is an opportunity to make a distinctive contribution to enrich the race's comfort through our labors.

In the September issue of the SCOPE there was published the *Code of Ethics* of the American Optometric Association. It is our duty to study this code and memorize it so that at all times we can live up to it, not only in spirit but to the letter. In doing this we will be taking a step forward on our pathway to a successful practice.

Ethical Optometry should be the aim of all of us as individuals and every victory gained singly on this front will be a great help in making Optometry a leading profession. To play our part in its advancement; to live, work and sacrifice, if need be, for causes on which our professional hopes depend should be our ideal.

A Problem in Accommodation

by Dr. Ernest Petry

The line of reasoning that prompts this article may lead to nothing but disagreement, but it is hoped that it will arouse a modicum of thought that may eventually acquire a constructive aspect.

Speculation regarding the basis on which accommodation of the eye is generally regarded leads us into three realms of concept, which may be listed as picturing, first, a mechanical structure; second, an energy element; and, third, a required accomplishment.

Limiting one's consideration of accommodation to any one of these bases is productive of an incomplete concept of this most important function. At the same time, it is necessary to think clearly on the demand for emphasis on any one, two, or all three of these bases in certain problem cases.

The background of our thinking as it is applied to accommodation must naturally be predicated with a fundamental knowledge of the mechanical structure of accommodation and thus we must be able to visualize the crystalline lens, its capsule and supporting suspensory ligament and the controlling ciliary muscles.

We are apt, because there is still considerable speculation on the versatility of this combined mechanism, to align ourselves with those who take the passive stand that the normal lens has spherical surfaces and that under muscular tension or relaxation this sphericity is not altered, or with those who would believe that every discrepancy in the diagnostic pattern is caused by a limitless versatility of this accommodative mechanism.

Because there is much that we do not know about the individual possibilities of this structure to be manipulated in a manner to provide compensation for anomalous vergence contributions, it is necessary for us to be tolerant with the beliefs of others, but most of all we must avoid taking an extreme position in those phases of the subject that may be classified as being speculative.

The second basis, that of the energy element, with its compound short ciliary nerve supply, is in a measure on a par with the mechanical structure of accommodation insofar as our exact knowledge of its distribution control is concerned. Here again it is necessary to avoid extreme affiliations with unproven variations or possibilities.

Under the third subdivision of our concepts, the required accomplishment, we are dealing with physical factors that are based on the differences between geometric optical contributions presented to the eye from objects at different distances. This phase of the subject can, therefore, be attacked without intervention of speculative elements.

With this encouragement as an incentive, we might first give our attention to an eye that may be classified as being emmetropic and with a demonstrated capacity to adapt its optical system for the usual near object distances.

If in this specific case we assume that the near object is sixteen inches from the eye, the accommodative requirement resolves itself into an adaptation of the mechanical structure through the expending of nervous energy, which will enable the optical system of the eye to focus, on its retina, the optical contribution of 2.5 D coming from the object.

This 2.5 D contribution is the value of the pencil of light received in the plane of the cornea.

If 2.5 D is the maximum light divergence for which the optical system of the eye can adapt itself, and the eye can be assumed to be emmetropic, this 2.5 D is considered as the amplitude of accommodation.

We have assumed in this example that, during the process of adaptation of the

mechanical structure of accommodation to this light divergence contribution, the surfaces of the crystalline lens remained spherical. This is one of the angles of accommodative accomplishment that merits investigation because the energy requirement necessary to cause the circle of least diffusion to be received on the retina, must be relatively greater in cases of unequal meridional changes in optical strength than in those where equality is maintained.

This thought must continue to be speculative until satisfactory investigation with adequate equipment provides the solution.

Reverting to the required accomplishment phase of the accommodation problem, let us assume that we are dealing with an eye that requires a plus 4 Dv placed approximately 15 mm from the cornea to correct the ametropia.

In the case of an eye so corrected, light coming from a great distance and that coming from an object at 16 inches will be received with a vergence difference approximating 3 D, depending on the combination of curves and thickness that are employed to produce the 4 Dv lens.

This 3 D vergence difference represents the required accommodative accomplishment, which is .50 D more than that determined for the emmetropic eye and is significant of the fact that plus lens corrections necessitate greater amplitudes of accommodation for a relative equality of energy expenditure.

Let us now take up the question of the accommodative requirement of an eye in which one meridian is emmetropic and the meridian at right angles to it requires a plus 4 Dv correction placed approximately 15 mm from the cornea.

In this case we have a combination of the two examples previously cited, and are herein confronted with the fact that the required accommodation for a 16 inch object distance makes it essential that either the mechanical structure of accommodation insure the producing of a refined retinal image or a cylindrical bifocal addition be provided.

This practical problem presents a real opportunity for research to determine whether the mechanical structure plus the energy element of an eye can comfortably and efficiently adapt itself to meet the requirements of accomplishment in this and many other varieties of cases, or whether a new series of bifocal lenses must be developed to provide the solution.

This problem is amplified when we apply it to the binocular phase of our work, in which we are not merely interested in conserving accommodative activity, but more particularly in the smooth rythmic binocular adaptation of a pair of eyes for all object positions.

In any event, the basis of our investigation hinges itself on the required accommodative accomplishment which must be expressed in terms of the vergence values presented to the cornea.

Our Own and Our Cousins' Eyes

by Dr. Thomas Hall Shastid

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(*Continued from September issue*)

BLIND CAVE DWELLERS AND RED LIGHT

And here I am going to digress again, because of an extremely important and new subject. Blind cave-dwelling animals of various sorts have recently been made to see. Let us consider the work of Professor Przibram, of Vienna. This man, in an artificial cave, bred successive generations of the blind, cave-dwelling amphibian, Proteus. By exposure to red light he developed, in the very first generation, the pin-head, perfectly blind eyes of Proteus, into large and fairly well functioning organs. No other kind of light than red would do the work. Also, exposure, even to the red light, of the adult Proteus gave no results. I have watched carefully for some applica-

tion of these astounding facts to the treatment of the human eye; but. thus far, have found absolutely nothing done, which is a fact still more astounding. Why should not some of the younger ophthalmologists investigate, in the human subject, the effects of red light on microphthalmos, microphakia, congenital amblyopia, and various other deficiencies in ocular development?

THE EYES OF TYPICAL FISH

But to return to the fishes. Let us take as typical the eyes of fish that live in well-lighted water. These eyes are all short sighted, because, even in the best lighted water, no eyes can see very far. A fish's cornea is always flat, because any convexity which it might possess would be completely nullified by the water fitting round it, since water has substantially the same index of refraction as the cornea. Moreover, flatness of cornea is an advantage, because a flat cornea is not so easily injured as a prominent one, and nearly all fish. we recall, have no protection from eyelids. If this were the whole story, a fish would be from 32 to 40 diopters far-sighted. But, to offset the flatness of the cornea, there is a spherical lens, with a high index of refraction, which more than overcomes the far sight of the cornea, and actually makes the fish a few diopters short-sighted, which is precisely the condition he needs in his habitat.

Fish are about all color blind. Tell this to a fisherman with his brightly colored flies, and he will laugh at you; nevertheless, it is a demonstrable fact. [2] Fish have also a very restricted visual field. Anything below the level of the head they scarcely see at all.

(*Continued in November issue*)

2 Zolotnotsky, in 1901, made the following false experiment. For a long time he fed certain fish, which were kept in an aquarium, with maggots of a dark red color. He then fastened inside the aquarium wall woolen imitations of these maggots, but of white, green, yellow and red. The fish paid no attention at all to the white and green, hesitated a little before the yellow but darted immediately at the red and ate them greedily. From this experiment Zolotnotsky concluded that fishes have color sense. The experiment was about on a par, in the matter of scientific accuracy, with the careless observations which some people make when fishing.

A few years after Zolotnotsky's experiment, a long series of very careful experiments on the color sense of fishes was made by Hess. It was well known to Hess that a completely color blind human being easily learns to tell colors apart and even to name them as normal persons do, simply by noting the difference in the illumination, or relative quantities of light given off by objects of various colors under the same brightness of light. (Black and white are not, in this connection, regarded as colors; neither are grays, which are simply mixtures of black and white). That is to say, to a totally color blind person, white looks white and black looks black; also gray (any mixture of black and white) looks gray. And all the various colors look gray to him also. Green, for example, looks a very light gray; yellow, a gray of medium darkness; and red, a very dark gray, almost a black. For this reason it is that, when examining railroad men, lighthouse keepers, and so forth, for color blindness, we must be exceedingly careful or we shall make serious mistakes. Hess, keeping in mind these things, conducted his experiments with very great accuracy. And they all lead without one single exception to the same conclusion—namely, that fish have no color sense.

Here are some of the simpler experiments. A red bait and a dark gray bait (which, to a totally color blind person, look exactly alike) were fastened at intervals about the aquarium walls, and all were equally illuminated, as well as provided with exactly the same backgrounds. The fishes swam to and ate both kinds of bait, red and dark gray, indifferently. Again, a series of gray baits only, ranging from very light grays to very dull grays, were fastened to the aquarium walls, and the fish once more permitted to enter the aquarium. They all swam to the dark gray baits, and ate them immediately, leaving unnoticed the lighter grays. It was, therefore, the intensity of the illumination reflected from the baits (not shed upon them) and not color sense at all, which had guided the fishes.

Here is one more of the experiments. There was fastened against the outside of one aquarium wall, a dark blue paper. Inside the wall, and against this background of dark blue, were hung a number of dark red artificial baits, of such a shade that the quantity of light reflected from a given unit, say a square inch, of bait and of background was exactly the same. The fish, being permitted to enter the aquarium, were not able to find the baits, although the contrast, to a normal human eye, between the dark blue and the dark red was exceedingly striking. When the background was made a much lighter blue, or a much darker blue, then the fish would shoot to the bait without the slightest hesitation and devour it greedily.

Similar experiments have been conducted in ponds, streams, and lakes, all with the same results. But the experiments in aquariums and reservoirs have been the most conclusive, because, in the artificial containers, the fish were under complete control, *i, e.*, they could be kept hungry at will, etc.

Senior News

Do you know that — Berger has patented his latest invention; a new phoria card both for distance and near (It's just 96/100 perfect — 4% off!)

Malamut, Lokitz, and Pinckert had a hectic eight hour ride one night and arrived at school sans sleep, sans eats. etc.!!

Carvin was deeply engrossed over the mathematical calculations regarding Chelsea High's football chances with Brockton. (He finally wound up with 3/10,000% of a chance — How about it — Tuells?)

Swartz's latest fad is gradually becoming the class amusement. Some of his "angle shots" really are interesting, especially those of Drs. Cline and Green! (Rather expensive — though!)

Shack appears to be going puritan on us as Plymouth seems to have caught his fancy: (Whitman boy makes good — blunder!!)

The Frat. has started off on its right foot again and soon the Red-green blind from Chelsea will be viewing green bow ties or somethin' !!

Sheinman while 'scoping Burns' fundus suddenly saw everything become black. Becoming very alarmed he glanced at Paul and with very great composure, lit a Murad, — and aided him in returning his O. S. to his socket!! (Reference — Dr. Sloane).

Shepard has become highly myopic (O. D.) also his choice of femininity is "of the best" as quoted by Beth Israel personel!!

Taillon has gone artistic and his adeptness with a "pencil" really is remarkable!! By the way, the "change" is also uncanny!!

Quincy had quite some experience at a girl's camp last summer and learned how to cook, swim, dance, etc.!! (Ask Cohen for all particulars and details??)

Levin has become quite enthusiastic about "his" basketball quintuplet and good luck to the boys — they'll need it! How about turning out and giving the boys an incentive? "Pitt" is scheduled!!!

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